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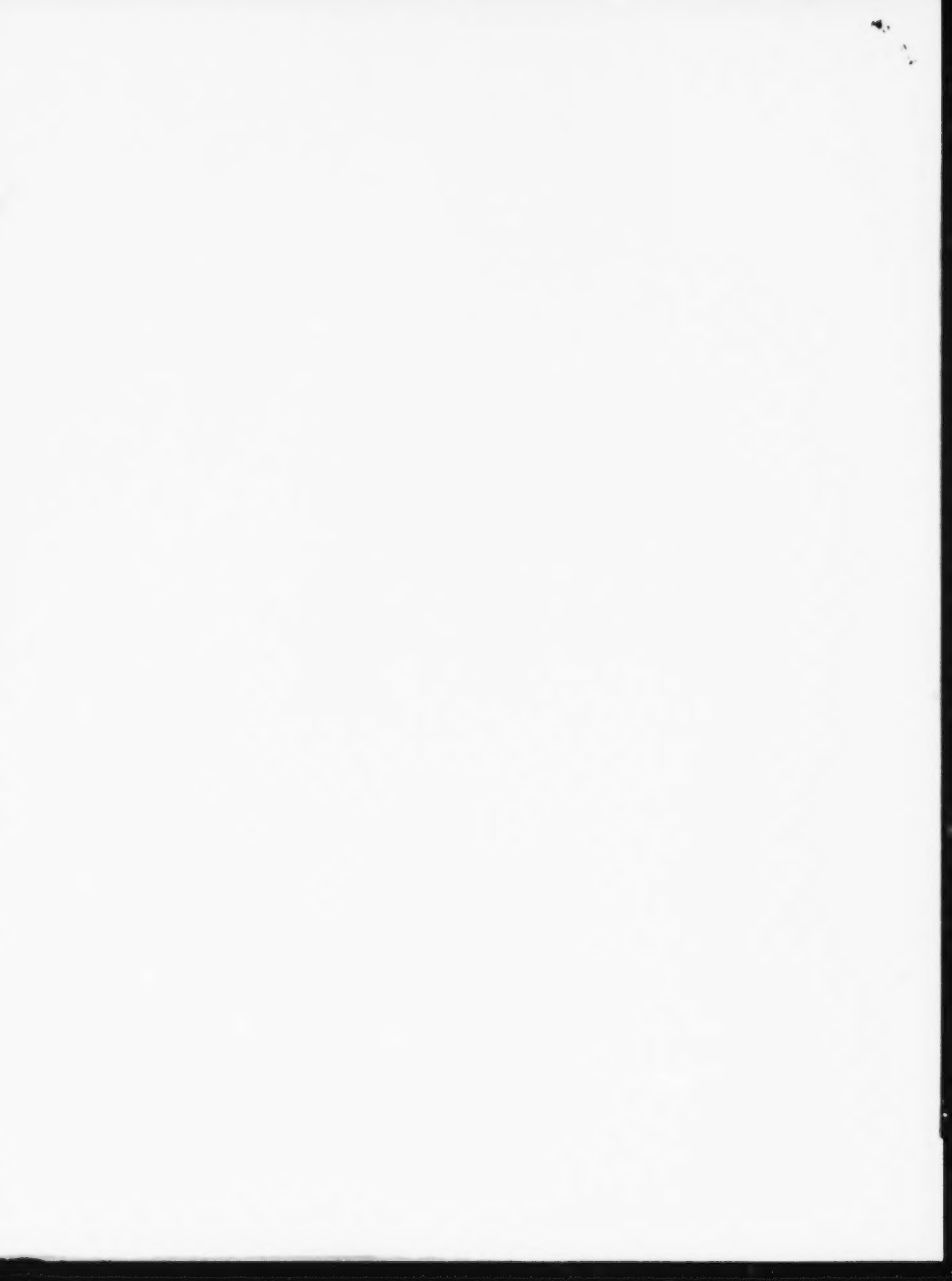


the people
& workplace
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Employment and Wages for Alberta Workers with a Post-Secondary Education

**Prepared By:
Data Development and Evaluation**

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Abstract

Between 2004 and 2009, Alberta's economy is expected to add over 223,000 new jobs to the labour force.¹ In addition, 61.8% of all new jobs are expected to require some form of learning beyond high school, or post-secondary education.² Post-secondary education is a degree, certificate (including a trade certificate) or diploma from an educational institution beyond the secondary (high school) level.³

According to the 2004 Alberta Careers Update, more education and training is expected to be a key to success in the new economy. Over the next five years, there will be a strong demand for occupations that need university degrees and projections have indicated that over one fifth of all new jobs will go to university graduates. Furthermore, nearly one third of all new jobs will be in occupations requiring post-secondary college, technical, and trades training. Just over one quarter of all new jobs will be in occupations requiring completion of grade 12 and occupations requiring less than grade 12 will only account for about one out of every ten new jobs.⁴

A major challenge with this growth in employment is matching the demands of the new workplace and evolving economy with the skills of its workforce. Since the new jobs created will favour the well qualified, post-secondary education is a requisite for having a competitive advantage in the labour force. Specifically, this report investigates the relationship between education levels, employment, and earnings. The report tests the hypothesis that as people get more education, the chance of obtaining employment and earning higher wages or salaries increases. By using data from the 2004 Labour Force Survey, expected wages and salaries of non-graduates and graduates of post-secondary schooling have been analyzed. The main findings of this investigation are that for both males and females, a higher level of educational attainment results in increased participation in the workforce, additional employment opportunities, reduced chance of unemployment, higher pay, and higher earnings throughout a working career.

¹ *Alberta Regional Occupation Outlook: 2004-2009 Provincial Summary Report*, Alberta Human Resources and Employment, October 2004

² *Alberta Modified COPS Forecast, 2004-2009*

³ Statistics Canada's Labour Force Survey (2004 Historical)

⁴ *Alberta Careers Update*, Alberta Human Resources and Employment, 2004

Background

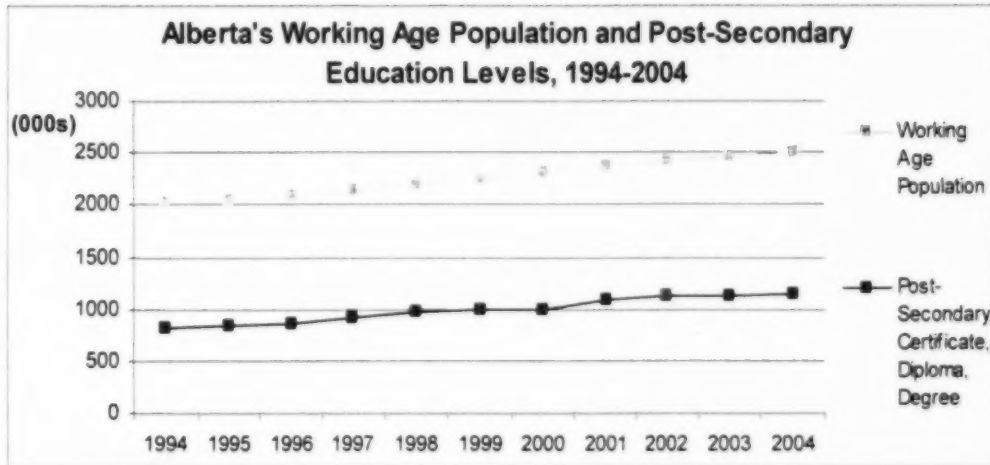
Alberta's Working Age Population

The working age population is composed of persons 15 years of age and over, excluding persons living on Indian reserves, inmates of institutions, and full-time members of the Canadian Armed Forces.⁵

In 2001, 53.4% of Canadians were continuing schooling beyond high school.⁶ In 2004, more than 14.3 million Canadians aged 15 years and over had some level of post-secondary education.⁷

Figure 1 displays Alberta's working age population and those who received a post-secondary certificate or diploma or a university degree between 1994 and 2004. Over the decade, both groups increased in numbers. However, the percentage increase in those who completed some level of post-secondary education is greater than the increase of Alberta's working age population over the same period. Those who completed a post-secondary certificate, diploma, university bachelor's degree, and above a university bachelor's degree increased by 40.9% over the ten-year period. The total working age population increased by 24.2% over the same interval. So, as the decade progressed, proportionately more Albertans were completing some level of post-secondary education.

Figure 1



Data Source: Statistics Canada's Labour Force Survey (2004 Historical)

⁵ *The Labour Force Survey: Background and Explanation*, Alberta Human Resources and Employment, November, 2003

⁶ *Education in Canada: Raising the Standard*, 2001 Census, Statistics Canada, March 2003

⁷ Statistics Canada's Labour Force Survey (2004 Historical)

Alberta's Labour Force Education Levels

The labour force is composed of that portion of the working age population who, during the reference week, were employed or unemployed. The reference week is defined as the week containing the 15th day of the month in which information is collected for the Labour Force Survey.⁸

Table 1 shows the labour force and working age population education levels for Albertans in 1994 and 2004. Between 1994 and 2004, the percentage change in Alberta's labour force with a post-secondary certificate or diploma was the highest at 41.7 percentage points, followed by a 38.8 percentage point increase for those with some post-secondary education. In addition, the change in those completing a university degree was 36.8 percentage points, where the change in those obtaining a university bachelor's degree was 38.0 percentage points and the change in those earning above a bachelor's degree was 33.5 percentage points. While the number of Albertans in the labour force not completing high school decreased by 3.9 percentage points, the number of high school graduates in the labour force increased by 24.1 percentage points.

Between 1994 and 2004, the percentage change in the working age population by education level was greatest for university bachelor's degree holders at 42.3 percentage points, followed by a post-secondary certificate or diploma at 41.4 percentage points, and by some post-secondary at 35.2 percentage points. The participation rates for all but two education levels decreased from 1994. For those with some post-secondary the participation rate increased by 2.0 percentage points, and the participation rate for those with a post-secondary certificate or diploma increased by 0.2 percentage points. The participation rate for Albertans with a bachelor's degree changed by the largest absolute value of all education levels, decreasing by 2.6 percentage points. The participation rates for less than high school, high school graduates, and above bachelor's degree decreased by 0.2, 0.5, and 0.6 percentage points, respectively.

⁸ *The Labour Force Survey: Background and Explanation*, Alberta Human Resources and Employment, November, 2003

Table 1

Less than high school graduation	301,600	575,100	52.4%	289,700	554,700	52.2%	-3.5%	-3.9%
High school graduate	340,000	435,600	78.1%	422,100	544,200	77.6%	24.9%	24.1%
Some post-secondary	138,400	189,000	73.2%	192,100	255,500	75.2%	35.2%	38.8%
Post-secondary certificate or diploma	432,800	535,400	80.8%	613,100	757,000	81.0%	41.4%	41.7%
Bachelor's degree	170,900	201,300	84.9%	235,800	286,400	82.3%	42.3%	38.0%
Above bachelor's degree	67,800	79,800	85.0%	90,500	107,200	84.4%	34.3%	33.5%
University degree (Bachelor's and Above)	238,600	281,200	84.9%	326,400	393,600	82.9%	40.0%	36.8%
Total*	1,451,300	2,016,300	72.0%	1,843,400	2,505,000	73.6%	24.2%	27.0%

Data Source: Statistics Canada's Labour Force Survey (2004 Historical)

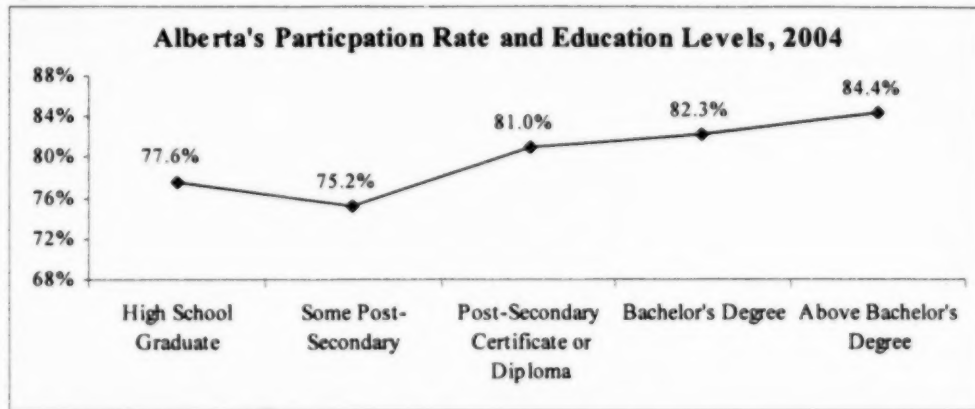
*Rounding Error

Labour Force Participation Rate and Education Levels

The participation rate represents the total labour force expressed as a percentage of the working age population (persons 15 years of age and older).⁹ Figure 2 displays Alberta's participation rate and education levels for 2004. The participation rate for those with a post-secondary certificate or diploma was 3.4 percentage points higher than for high school graduates. Albertans with an education level above a bachelor's degree experienced the highest participation rate, at 84.4% (6.8 percentage points higher than for high school graduates).

⁹ *The Labour Force Survey: Background and Explanation*, Alberta Human Resources and Employment, November, 2003

Figure 2



Data Source: Statistics Canada's Labour Force Survey (2004 Historical)

Employment Rate and Education Levels

The employment rate represents the number of persons employed expressed as a percentage of the working age population (persons 15 years of age and older). The employment rate reflects, to a certain extent, the state of an economy. A high employment rate indicates the ability of an economy to create jobs and to employ a large percentage of its working age population.¹⁰

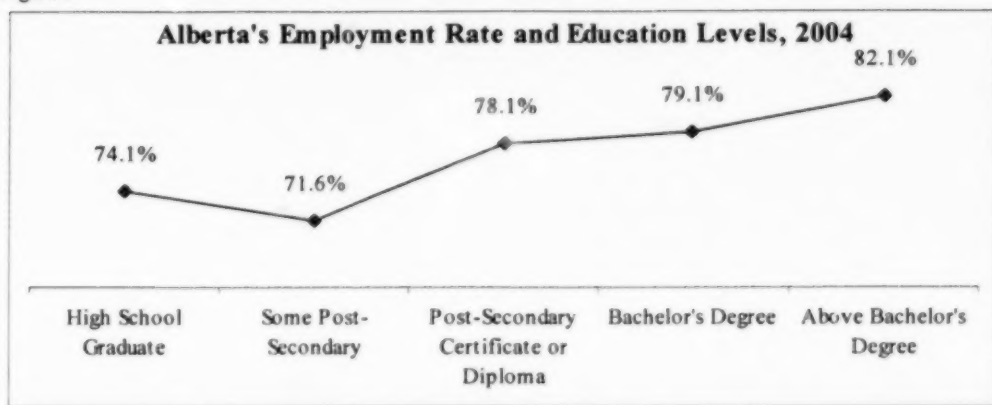
Job attainment in Alberta for those with a post-secondary education was higher than for those without. Between 1990 and 2000, employment increased by 45.0% for people with university degrees and by 52.0% for those with post-secondary diplomas or certificates, while employment for those with less than a high school education decreased by 13.0%.¹¹

Figure 3 displays Alberta's employment rate and education levels for 2004. The employment rate for those with a post-secondary certificate or diploma was 4.0 percentage points higher than for high school graduates. Albertans with a university above bachelor's degree experienced the highest employment rate of 82.1%. Figure 3 clearly indicates that graduates enjoy significantly higher employment rates than those with unfinished scholarly work.

¹⁰ *The Labour Force Survey: Background and Explanation*, Alberta Human Resources and Employment, November, 2003

¹¹ *Prepared for Growth: Building Alberta's Labour Supply*, Labour Force Planning Committee, Government of Alberta, 2001

Figure 3

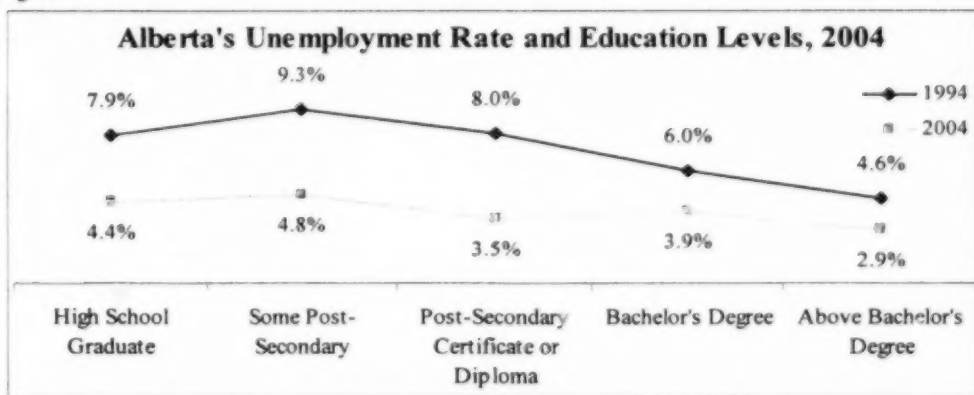


Data Source: Statistics Canada's Labour Force Survey (2004 Historical)

Unemployment Rate and Education Levels

The unemployment rate represents the number of unemployed persons expressed as a percentage of the labour force.¹² Figure 4 reflects the unemployment rate of Albertans with varying degrees of education. Those who earned a university degree had a competitive advantage in the labour force, indicated by a significantly lower unemployment rate than for other education levels. Furthermore, with each level of education attained, the incidence of involuntary part-time employment (meaning those who are employed are more likely to be working part time when they would prefer to be working full time) decreases.¹³

Figure 4



Data Source: Statistics Canada's Labour Force Survey (2004 Historical)

¹² *The Labour Force Survey: Background and Explanation*, Alberta Human Resources and Employment, November, 2003

¹³ *Education Indicators in Canada*, Statistics Canada Document 81-582-XIE, 1999

Employment and Education Levels in Alberta

Background

This section discusses employment and education levels in Alberta. Tables created by Alberta Human Resources and Employment (AHRE) from Statistics Canada's Labour Force Survey show the employment probability for males and females in 2004.

Tables 2B (males) and 3B (females) have been analyzed by using contingency tables. These tables are important tools for understanding the nature of the data, and how the different variables (employment and education) are related to, or "contingent" on, one another. Contingency tables are useful in representing the results for data users in much the same way as an analysis of variance. In this case, the contingencies test to see if the probability of being employed depends on the education level attained.

Male Working Age Population in Alberta

Tables 2A and 2B compress the age segments into labour force age categories (detailed analysis listed in Appendix A). Table 2A displays education levels and the probability of employment for males in Alberta in 2004. Table 2B investigates the relationship between higher levels of education and employment. Specifically, Table 2B tested the hypothesis that as male Albertans received more education, their chance of finding employment would increase. By using the Chi-Square test, the significance of the employment probabilities for males with relation to level of education was examined. The test compared existing data on employment probabilities and education levels.

Table 2A shows that males aged 25 to 44 with only a high school graduation certificate had a 46% employment probability, with some post-secondary there was a 43% probability of employment, with a post-secondary certificate or diploma there was a 53% employment probability, with a university bachelor's degree there was a 57% employment outlook, and with a university graduate degree there was a 42% prospect for employment. Males aged 45 to 64 with only high school graduation had a 29% chance of employment, with some post-secondary had a 22% employment probability, with a post-secondary certificate or diploma had a 38% probability of employment, with a university bachelor's degree had a 37% chance of gaining employment, and with a university graduate degree had a 54% employment probability.

Table 2A

Age Group	15 to 24	25 to 44	45 to 64	65+	Total
15 to 24	0.23	0.34	0.07	0.04	0.01
25 to 44	0.46	0.43	0.53	0.57	0.42
45 to 64	0.29	0.22	0.38	0.37	0.54
65+	0.02	0.01	0.02	0.02	0.04
Total	1.00	1.00	1.00	1.00	1.00

Data Source: Calculated Using Statistics Canada, Labour Force Survey Microdata

Prepared by: Economic and Demographic Analysis, Data Development and Evaluation, Alberta Human Resources and Employment

Table 2B indicates that for those males in the working age population that were employed, approximately 27% possessed only a high school diploma, about 12% had completed some post-secondary studies, just over 40% of the male working age population had a post-secondary certificate or diploma, 14% had a university bachelor's degree, and more than 6% had a university graduate degree (master's or doctorate).

Close to 14% of employed male Albertans were in the 15 to 24 age group, approximately half were in the 25 to 44 age group, over 34% were in the 45 to 64 age category, and roughly 2% of those employed were 65 years of age and above.

Table 2B

Education Levels of Sample Household - 2004						
Age Group	High School Graduate	Post-Secondary Certificate or Diploma	Bachelor's Degree	Graduate Degree	Total	
15 to 24	6.16%	4.14%	2.69%	0.62%	0.04%	13.66%
25 to 44	12.43%	5.21%	21.61%	7.95%	2.73%	49.93%
45 to 64	7.81%	2.60%	15.30%	5.19%	3.57%	34.47%
65+	0.45%	0.15%	0.87%	0.24%	0.23%	1.94%
Total	26.86%	12.09%	40.47%	14.01%	6.57%	100.00%

Data Source: Calculated Using Statistics Canada, Labour Force Survey Microdata

Prepared by: Economic and Demographic Analysis, Data Development and Evaluation, Alberta Human Resources and Employment

The association between education and employment was statistically significant at the 0.01 level of probability (99% confidence level). The results indicate that there was a strong relationship between the level of educational attainment and employment. This finding is supported by past research.^{14,15} Therefore, as males attain higher levels of education and skills, their chance of finding employment increases.

¹⁴ *Study on the Relationship Between Education, Training and Employment*, P. M. Leelaratne, 2001

¹⁵ *Prepared for Growth: Building Alberta's Labour Supply*, Labour Force Planning Committee, Government of Alberta, 2001

Female Working Age Population in Alberta

The values for the probability of employment with respect to level of education are presented in tables 3A and 3B. For simplicity, Tables 3A and 3B compress the age segments into labour force age categories (detailed analysis listed in Appendix B). Table 3B investigated the relationship between higher levels of education and employment. By using Chi-Square analysis, Table 3B tested the hypothesis that as females obtained more education their chance of finding employment would increase.

Table 3A shows that females aged 25 to 44 with only high school graduation had a 43% employment probability, with some post-secondary had a 38% outlook for employment, with a post-secondary certificate or diploma had a 53% probability of employment, with a university bachelor's degree had a 57% prospect for employment, and with a university graduate degree had a 56% employment probability. For females aged 45 to 64 with only a high school graduation certificate there was a 35% probability of employment, with some post-secondary a 22% employment outlook, with a post-secondary certificate or diploma there was a 36% prospect for work, with a university bachelor's degree there was a 36% employment probability and with a university graduate degree there was a 42% probability of employment.

Table 3A

15 to 24	0.20	0.39	0.09	0.06	0.01
25 to 44	0.43	0.38	0.53	0.57	0.56
45 to 64	0.35	0.22	0.36	0.36	0.42
65+	0.04	0.03	0.05	0.03	0.04
Total	1.00	1.00	1.00	1.00	1.00

Data Source: Calculated Using Statistics Canada, Labour Force Survey Microdata

Prepared by: Economic and Demographic Analysis, Data Development and Evaluation, Alberta Human Resources and Employment

The data in Table 3B shows that of the female working age population who were employed, approximately 27% only had a high school education, over 13% had some post-secondary education, nearly 39% of employed female Albertans had a post-secondary certificate or diploma, close to 17% had a university bachelor's degree, and more than 5% possessed a university graduate degree.

Of these employed female Albertans who had completed high school or more, about 15% were in the 15 to 24 age category, just under half were in the 25 to 44 age group, roughly 34% belonged in the 45 to 64 age profile, and more than 1% were over 65 years of age.

Table 3B

15 to 24	5.57%	4.83%	3.65%	1.07%	0.06%	15.18%
25 to 44	11.60%	4.76%	20.55%	9.38%	2.89%	49.18%
45 to 64	9.67%	2.73%	13.91%	5.88%	2.14%	34.33%
65+	0.39%	0.12%	0.58%	0.20%	0.03%	1.31%
Total	27.23%	12.44%	38.68%	16.52%	5.12%	100.00%

Data Source: Calculated Using Statistics Canada, Labour Force Survey Microdata

Prepared by: Economic and Demographic Analysis, Data Development and Evaluation, Alberta Human Resources and Employment

The relationship between employment and education was statistically significant at the 0.01 level (99% confidence level), and is consistent with previous studies.¹⁶ The outcome of this test shows that as females gain more knowledge, skills, and experience, their chance of finding employment improves. The results, therefore, indicate that training and education are paramount in terms of gaining employment and employment rates are highest for female graduates of post-secondary education.

Wage, Salary and Education Levels in Alberta

Background

For the year 1999 in Canada, the mean earnings (before taxes) were 62% higher for university graduates and 12% higher for college or trade graduates in comparison to individuals with high school diplomas. Those who did not complete high school earned 21% less than those who did.¹⁷

Higher education is a gateway to higher earnings. In 2000, more than 60.0% of Canadians who earned over \$100,000 per year had a university degree, and more than 60.0% of those who earned less than \$20,000 yearly had no more than a high school education.¹⁸ In 2003, in the 25 to 29 age group, university graduates earned an average of \$31,000, or about a third more than those with less than high school who earned \$21,000. In the 50 to 54 age group, university-trained workers earned an average of \$61,000, more than twice the earnings of workers with less than high school, at \$29,000.¹⁹

The following section compares wage and salary information to level of education in Alberta. This section tests whether wage amounts are related to or dependent on the level of education that female and male Albertans have against the alternative hypothesis that

¹⁶ *Precarious Employment, Education and Gender: A Comparison of Germany and the United Kingdom*, Anna Kim, Karin Kurz, 2001

¹⁷ *Education Indicators in Canada*, Statistics Canada Document 81-582-XPE, 2003

¹⁸ *Earnings of Canadians: Making a Living in the New Economy*, Statistics Canada, 2001 Census

¹⁹ *Education Indicators in Canada*, Statistics Canada Document 81-582-XPE, 2003

wage earnings are independent or unrelated to level of education. To determine whether the association between education levels and wages was statistically significant, the Chi-Square test was used. Tables created by AHRE from Statistics Canada's Labour Force Survey (2004) show the expected wages for males and females.

Male Population in Alberta

Tables 4A and 4B show how wage rate relates to level of education. In Table 4B, which has been analyzed using contingency tables similar to those used in the previous section on employment and education, each row represents an age grouping and each column represents a level of educational achievement. Each cell in the table displays a percent value that is a numerical combination of the two variables.

Average hourly wage rates are displayed for Alberta males, ages 15 to 64, in Table 4A. The table demonstrates that males experienced an increase in average hourly wage amounts with completion of a post-secondary education. Alberta males consistently attained higher average hourly wage rates upon completion of a post-secondary certificate, diploma, university bachelor's degree, and a university graduate degree.

Table 4A shows that males, ages 15 to 64, with only high school graduation could expect to earn an average of \$17.24 per hour. Additionally, males of this age with some post-secondary education made \$17.28 hourly on average, with a post-secondary certificate or diploma could anticipate earning \$20.12 an hour, with a university bachelor's degree made an average hourly wage of \$24.71, and those with a university graduate degree earned \$27.08 on average per hour.

Table 4A

Education and Wage					
Age Group	High School Graduation	Post-Secondary Certificate or Diploma	University Bachelor's Degree	University Graduate Degree	Average
15 to 19	\$ 8.03	\$ 7.39	\$ 9.61	n/a	n/a
20 to 24	\$ 12.01	\$ 9.70	\$ 13.44	\$ 13.62	\$ 14.94
25 to 29	\$ 15.51	\$ 13.75	\$ 17.51	\$ 20.68	\$ 18.21
30 to 34	\$ 17.03	\$ 17.98	\$ 20.68	\$ 23.00	\$ 24.83
35 to 39	\$ 19.06	\$ 19.65	\$ 22.45	\$ 28.46	\$ 24.47
40 to 44	\$ 19.26	\$ 24.11	\$ 24.16	\$ 25.72	\$ 31.61
45 to 49	\$ 20.89	\$ 18.75	\$ 24.98	\$ 30.74	\$ 32.80
50 to 54	\$ 21.67	\$ 24.22	\$ 25.51	\$ 32.55	\$ 38.34
55 to 59	\$ 21.72	\$ 22.99	\$ 23.12	\$ 27.66	\$ 33.60
60 to 64	\$ 17.23	\$ 14.27	\$ 19.74	\$ 19.95	\$ 24.95
Average	\$ 17.24	\$ 17.28	\$ 20.12	\$ 24.71	\$ 27.08

Data Source: Calculated Using Statistics Canada, Labour Force Survey Microdata

Prepared by: Economic and Demographic Analysis, Data Development and Evaluation, Alberta Human Resources and Employment

*Data for ages 65+ was too unreliable to publish

Table 4B shows that male Albertans, ages 15 to 64, with only a high school diploma made 17% of the total earnings for this gender and age in 2004. While male wage earners of this age with some post-secondary education also made roughly 17%, those with a post-secondary certificate or diploma made close to 20%, with a university bachelor's degree earned about 22%, and with a university graduate degree made over 24% of the total earnings for this age and gender in Alberta.

Table 4B

15 to 19	0.79%	0.73%	0.95%	n/a	n/a	2.47%
20 to 24	1.19%	0.96%	1.33%	1.35%	1.48%	6.29%
25 to 29	1.53%	1.36%	1.73%	2.04%	1.80%	8.46%
30 to 34	1.68%	1.78%	2.04%	2.27%	2.45%	10.22%
35 to 39	1.88%	1.94%	2.22%	2.81%	2.42%	11.27%
40 to 44	1.90%	2.38%	2.39%	2.54%	3.12%	12.33%
45 to 49	2.06%	1.85%	2.47%	3.04%	3.24%	12.66%
50 to 54	2.14%	2.39%	2.52%	3.21%	3.79%	14.05%
55 to 59	2.15%	2.27%	2.28%	2.73%	3.32%	12.75%
60 to 64	1.70%	1.41%	1.95%	1.97%	2.46%	9.49%
Total	17.03%	17.07%	19.87%	21.96%	24.07%	100.00%

Data Source: Calculated Using Statistics Canada, Labour Force Survey Microdata

Prepared by: Economic and Demographic Analysis, Data Development and Evaluation, Alberta Human Resources and Employment

The results from this test were statistically significant at the 0.01 level of probability (99% confidence level), and these findings are consistent with past research.²⁰ Consequently, wage rates depend on level of education.

Female Population in Alberta

Alberta females experienced a large increase in hourly wage rates with higher levels of education, even though female wage amounts were lower than males. Females with a university bachelor's degree experienced a higher hourly wage at a younger age, and this was consistent throughout the working age population. Alberta females with a university graduate degree experienced the highest average hourly wage rate.

Tables 5A and 5B display the relationship between education and wages for females, ages 15 to 64, in the labour force. In Table 5B, which has been analyzed using contingency tables in the same manner as Table 4B, each row represents an age grouping and each column represents an education level. Each cell in the table displays a percent value that is a numerical combination of the two variables.

²⁰ *Precarious Employment, Education and Gender: A Comparison of Germany and the United Kingdom*, Anna Kim, Karin Kurz, 2001

Table 5A shows that Alberta females, ages 15 to 64, with only high school completion earned an average of \$12.54 hourly. Female Albertans of this age with some post-secondary could expect to earn an average of \$12.65 per hour, with a post-secondary certificate or diploma made an average of \$15.14 per hour, individuals with a university bachelor's degree made \$18.87 on average, per hour, and those with a university graduate degree earned an average of \$23.92 per hour.

Table 5A

Age Group	High School Completion	Post-Secondary Certificate or Diploma	University Bachelor's Degree	University Graduate Degree	Average
15 to 19	\$ 6.99	\$ 5.70	\$ 7.68	\$ 10.34	n/a
20 to 24	\$ 9.15	\$ 8.61	\$ 11.41	\$ 14.02	\$ 11.46
25 to 29	\$ 11.25	\$ 9.97	\$ 13.76	\$ 16.33	\$ 17.46
30 to 34	\$ 12.05	\$ 12.27	\$ 15.98	\$ 18.85	\$ 23.29
35 to 39	\$ 13.61	\$ 13.68	\$ 15.72	\$ 20.55	\$ 25.20
40 to 44	\$ 14.61	\$ 15.24	\$ 17.59	\$ 21.42	\$ 21.25
45 to 49	\$ 15.16	\$ 16.35	\$ 18.53	\$ 24.01	\$ 33.77
50 to 54	\$ 14.78	\$ 18.00	\$ 17.77	\$ 23.77	\$ 31.18
55 to 59	\$ 14.26	\$ 13.88	\$ 16.78	\$ 23.04	\$ 25.41
60 to 64	\$ 13.53	\$ 12.83	\$ 16.22	\$ 16.39	\$ 26.24
Average	\$ 12.54	\$ 12.65	\$ 15.14	\$ 18.87	\$ 23.92

Data Source: Calculated Using Statistics Canada, Labour Force Survey Microdata

Prepared by: Economic and Demographic Analysis, Data Development and Evaluation, Alberta Human Resources and Employment

*Data for ages 65+ was too unreliable to publish

Table 5B shows the relationship between education and wages for females ages 15 to 64 in the labour force. For this female population in Alberta, those with only a high school diploma made close to 16% of the total earnings for this age and gender in 2004. In addition, female wage earners in Alberta with some post-secondary education made about 16% of the total earnings, and individuals with a certificate or diploma made close to 19% of the possible remuneration. Those with a university bachelor's degree managed over 23% of the total earnings, and females with a university graduate degree made nearly 27% of the total earnings for this age and gender in Alberta.

Table 5B

15 to 19	0.87%	0.71%	0.95%	1.28%	n/a	3.80%
20 to 24	1.13%	1.07%	1.41%	1.74%	1.42%	6.77%
25 to 29	1.39%	1.23%	1.70%	2.02%	2.16%	8.52%
30 to 34	1.49%	1.52%	1.98%	2.33%	2.88%	10.21%
35 to 39	1.69%	1.69%	1.95%	2.55%	3.12%	11.00%
40 to 44	1.81%	1.89%	2.18%	2.65%	2.63%	11.16%
45 to 49	1.88%	2.03%	2.30%	2.97%	4.18%	13.35%
50 to 54	1.83%	2.23%	2.20%	2.94%	3.86%	13.07%
55 to 59	1.77%	1.72%	2.08%	2.85%	3.15%	11.56%
60 to 64	1.68%	1.59%	2.01%	2.03%	3.25%	10.55%
Total	15.53%	15.67%	18.76%	23.37%	26.66%	100.00%

Data Source: Calculated Using Statistics Canada, Labour Force Survey Microdata

Prepared by: Economic and Demographic Analysis, Data Development and Evaluation, Alberta Human Resources and Employment

The association between wage rates and education levels was statistically significant at the 0.01 level of probability (99% confidence level), and is supported by past findings.^{21,22} Consequently, tables 5A and 5B show that wage amounts were related to the level of education that female Albertans, ages 15 to 64, had against the alternative hypothesis that wage earnings were independent or unrelated to level of education. This means that females with greater levels of education can expect to earn greater wage amounts.

Education and Earnings

The information in Chart 1 displays the relationship between level of post-secondary education and earnings. Alberta Learning has calculated earnings as the average annual gross salary and the average annual adjusted salary. The average annual adjusted salary includes federal and provincial income taxes, cost of living adjustments using the Consumer Price Index, Canadian Pension Plan premiums, Employment Insurance premiums, and health care insurance premiums (75% of levy borne by the employee and 25% paid by the employer).²³

Using the average annual adjusted salary, a post-secondary certificate or diploma graduate could expect to earn 24.78% more than a high school graduate, a university bachelor's degree graduate could anticipate earning 17.91% more than a post-secondary certificate or diploma graduate, and master's (graduate) degree and doctorate graduates could forecast earning 20.91% more than a university bachelor's degree graduate.

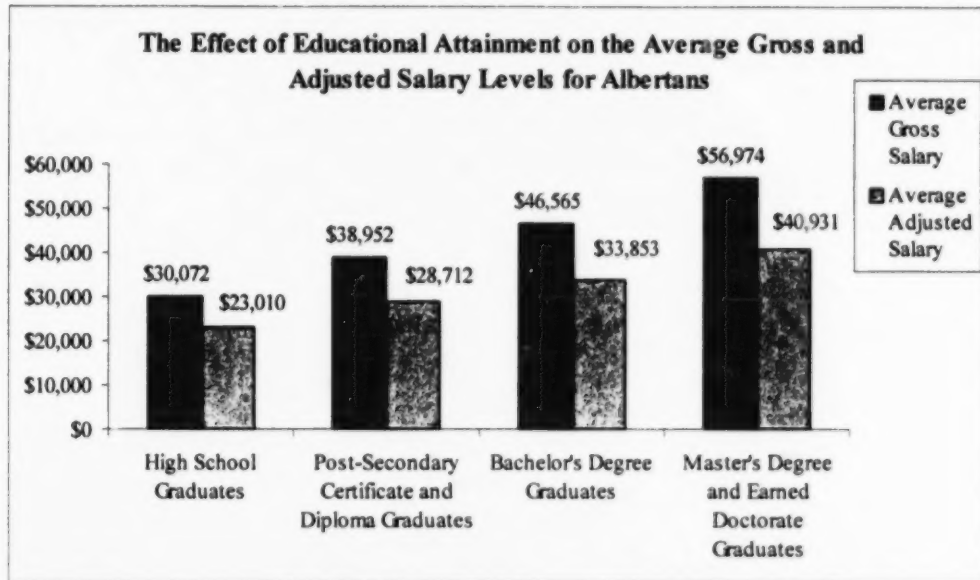
²¹ *Study on the Relationship Between Education, Training and Employment*, P. M. Leelarathne, 2001

²² *Prepared for Growth: Building Alberta's Labour Supply*, Labour Force Planning Committee, Government of Alberta, 2001

²³ *Post-secondary education pays off big - especially for Albertans*, Alberta Learning, September 8, 2003

Likewise, using the average annual gross salary, a post-secondary certificate or diploma graduate could estimate making 22.80% more than a high school graduate. A university bachelor's degree graduate could expect to earn 19.54% more than a post-secondary certificate or diploma graduate, and master's (graduate) degree and doctorate graduates could expect to make, on average, 22.35% more than a university bachelor's degree graduate. This is consistent with other findings that as ones credentials increase, income also increases.²⁴

Chart 1



Data Source: *Post-secondary education pays off big – especially for Albertans*, Alberta Learning, September 8, 2003

Summary and Conclusions

While Alberta's working age population increased by 24.2% between 1994 and 2004, the proportion of the population who had completed some level of post-secondary education increased by 40.9%, reflecting a growth rate almost twice that of the working age population. This growth rate suggests that Albertans believe the investment in post-secondary education yields desirable results.

Albertans with a university above bachelor's degree experienced the highest participation rate at 84.4%. This indicates that as the level of educational attainment increases, the probability of participating in the labour force also increases.

The employment rate for those with a post-secondary certificate or diploma was 4.0 percentage points higher than for high school graduates. Albertans with a university

²⁴ 2001/02 *Post-Secondary Institution Graduate Outcomes Survey*, Alberta Learning, 2004

above bachelor's degree experienced the highest employment rate, at 82.1%. Thus, there was a positive relationship between educational achievement and employment prospects.

As the education level of an individual increased, the probability of being unemployed decreased. This was evidenced by the fact that, amongst males, those possessing a university bachelor's degree or graduate degree in 2004 experienced the strongest possibility of employment throughout the majority of a working career. In addition, Alberta females with a higher level of post-secondary education had a more consistent and a higher probability of employment.

For both genders, there was a positive relationship between higher levels of education and higher average hourly wages. This is in concordance with the conclusions derived in TD Economics Topic Paper *A New Perspective on Wages: Education, Gender, and Age* that the wage premium for university educated workers versus non-university educated workers is substantial. Thus, it can be concluded that higher pay can be expected from higher education.

In conclusion, for both males and females, a higher level of educational attainment results in increased participation in the workforce, additional employment opportunities, reduced chance of unemployment, higher pay, and higher earnings throughout a working career.

Appendix A

Alberta Employment Probability for Males, 2004

For males aged 25 to 64*, an interesting pattern emerged. Males with some post-secondary education had a 65% likelihood of employment. However, when males had only completed high school, they had a 75% probability of employment, which was ten percentage points higher than for males with some post-secondary education. Employment outlook for post-secondary graduates with a certificate or diploma was 91%, a university bachelor's degree was 94%, and a university graduate degree was 96%. Consequently, employment prospects are much more desirable for graduates of post-secondary education than for non-graduates.

15 to 19	0.07	0.08	0.00	0.00	n/a
20 to 24	0.16	0.26	0.06	0.04	0.01
25 to 29	0.12	0.14	0.12	0.14	0.07
30 to 34	0.11	0.12	0.12	0.17	0.11
35 to 39	0.10	0.09	0.12	0.14	0.09
40 to 44	0.14	0.08	0.17	0.12	0.15
45 to 49	0.12	0.07	0.16	0.14	0.16
50 to 54	0.08	0.08	0.10	0.11	0.17
55 to 59	0.06	0.03	0.08	0.08	0.15
60 to 64	0.02	0.03	0.04	0.03	0.07
65 to 69	0.01	0.01	0.01	0.01	0.03
70+	0.00	0.01	0.01	0.01	0.01
Total	1.00	1.00	1.00	1.00	1.00

*Add the probabilities in the age groups 25 to 64 years for each level of education

Data Source: Calculated Using Statistics Canada, Labour Force Survey Microdata

Prepared by: Economic and Demographic Analysis, Data Development and Evaluation, Alberta Human Resources and Employment

Appendix B

Alberta Employment Probability for Females, 2004

Female Albertans aged 25 to 64* who only graduated high school had a 78% prospect for work. Females with some post-secondary could expect a 60% chance of employment and those who earned a post-secondary certificate or diploma had an 89% expectation of employment. For those with a university bachelor's degree the probability was 92%, and females who had achieved a university graduate degree had the brightest employment outlook of 98%. Thus, employment rates are highest for female graduates of post-secondary education.

Age Group	High School Graduate	Some Post-Secondary	Post-Secondary Certificate or Diploma	University Bachelor's Degree	University Graduate Degree
15 to 19	0.09	0.09	0.01	0.00	n/a
20 to 24	0.12	0.30	0.09	0.06	0.01
25 to 29	0.09	0.13	0.12	0.16	0.13
30 to 34	0.07	0.09	0.13	0.16	0.14
35 to 39	0.12	0.07	0.13	0.12	0.16
40 to 44	0.16	0.09	0.15	0.13	0.14
45 to 49	0.15	0.10	0.13	0.14	0.17
50 to 54	0.10	0.06	0.11	0.12	0.13
55 to 59	0.07	0.04	0.08	0.08	0.09
60 to 64	0.03	0.02	0.04	0.02	0.03
65 to 69	0.01	0.01	0.01	0.01	0.00
70+	0.00	0.00	0.00	0.00	0.00
Total	1.00	1.00	1.00	1.00	1.00

*Add the probabilities in the age groups 25 to 64 years for each level of education

Data Source: Calculated Using Statistics Canada, Labour Force Survey Microdata

Prepared by: Economic and Demographic Analysis, Data Development and Evaluation, Alberta Human Resources and Employment